Amyotrophic lateral sclerosis

Demystifying Medicine
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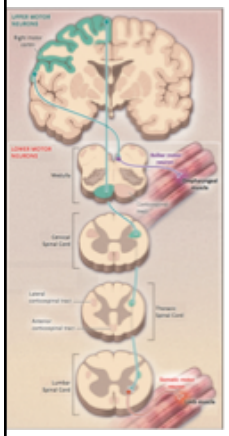
NIH National Institutes of Health
Turning Discovery Into Health

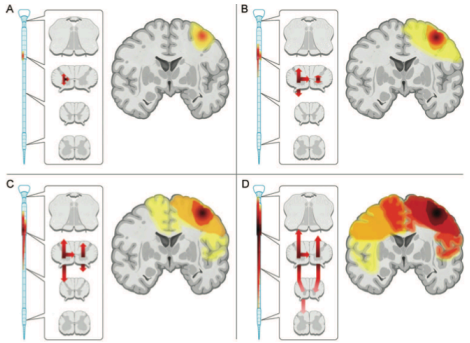


Amyotrophic lateral sclerosis
- known as Lou Gherig's disease in US
- Known as Motor Neurone Disease in UK

Jean-Marie Charcot described clinical and pathological syndrome of ALS in 1874
- Degeneration of corticospinal neuron, axons in lateral spinal cord
- Degeneration of spinal and brainstem motor neuron that innervate muscles

Patients develop weakness of voluntary movement
- Eating and swallowing
- Walking, using arms and hands
- Breathing

Symptoms begin focally and spread



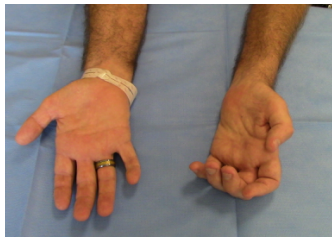
Hypothesized mechanisms
- Contiguous spread
- Spread through synaptic connections

Ravits 2009

Clinical Examination Findings

Muscle atrophy (amyotrophy)

Kiernan 2011 Lancet



Fasciculations

{video}

{video}

Bulbar upper and lower motor neuron signs

Upper Motor Neuron findings in arms and legs

{video}

ALS Patient Presentation

7-2005: 3 year progressive right leg stiffness

{video}

2005

{video, patient describing symptoms}

2007

{video, patient conversation}

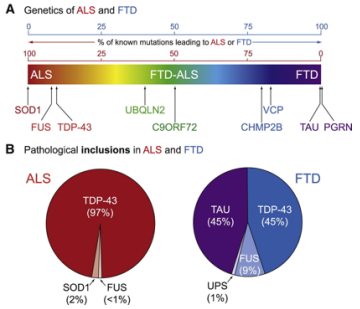
2008

(pardon camera shake..)

{video, patient conversation}

Motor Neuron Disorder Spectrum

- Clinical overlap between ALS and Frontotemporal dementia
  - cognitive and/or behavioral impairment in 1/3 of ALS patients
- Most ALS is <u>not</u> familial
  - Some genetic mutations can cause ALS or FTD, or a mixture – even in the same family!



Ling et al, Neuron, 2013

ALS-FTD Patient Presentation

Prior to illness

{video}

2013

{video, patient conversation}

2017

{video, patient conversation}

{video, clips edited from 3 YouTube videos }

https://www.youtube.com/watch?v=9H-GIcper1s
http://abcnews.go.com/Nightline/video/baseball-players-fight-als-leads-ice-bucket-challenge-50172544
https://www.youtube.com/watch?v=tSIYwH_4JLA

We thank the patients and caregivers for the generous gift of their time in participating of research studies at NIH. Their contributions are invaluable in understanding motor neuron disorders and working to develop treatments.